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IS 9002-11 (1984): Equipment for Environmental Tests for Electronic and Electrical Items, Part 11: Drop, Toppling and Free Fall Test Machine (Platform) [LITD 1: Environmental Testing Procedure]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS : 9002 (Part 11) - 1984

Indian Standard

SPECIFICATION FOR
EQUIPMENT FOR ENVIRONMENTAL TESTS
FOR ELECTRONIC AND ELECTRICAL ITEMS

PART 11 DROP, TOPPLING AND FREE FALL
TEST MACHINE/PLATFORM

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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Indian Standard

**SPECIFICATION FOR
EQUIPMENT FOR ENVIRONMENTAL TESTS
FOR ELECTRONIC AND ELECTRICAL ITEMS
PART 11 DROP, TOPPLING AND FREE FALL
TEST MACHINE/PLATFORM**

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*For the meeting in which this standard was recommended for finalization.

Indian Standard

SPECIFICATION FOR EQUIPMENT FOR ENVIRONMENTAL TESTS FOR ELECTRONIC AND ELECTRICAL ITEMS

PART 11 DROP, TOPPLING AND FREE FALL TEST MACHINE/PLATFORM

0. FOREWORD

0.1 This Indian Standard (Part 11) was adopted by the Indian Standards Institution on 14 May 1984, after the draft finalized by the Environmental Testing Procedures Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

0.2 The object of this standard (Part 11) is primarily to guide the environmental equipment manufacturers with respect to broad specifications for their equipment and to assist the users of such equipment to properly define the requirements in the indent for the equipment. The requirements of the equipment largely depend on environmental conditions to be simulated or created.

0.3 Certain requirements have been specified in a general form in view of practical difficulties in defining such requirements quantitatively. It is presumed that with the experience gained, more precise requirements will be laid down for such equipment.

0.4 An overall performance assessment of the complete equipment for a short duration has been included although it may be realized that it may not be entirely sufficient. This will at least ensure the functional performance and operability of the equipment. Many of the constructional requirements specified can be checked through visual examination.

0.5 In view of the subjective nature of some of the requirements, sufficient care shall be taken in using this standard.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded

*Rules for rounding off numerical values (revised).

off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part 11) lays down guiding requirements for the design of drop, topple and free fall test machine/platform required for carrying out drop, topple and free fall tests in accordance with Sections 3 and 4 of IS : 9000 (Part 7)-1979*.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions and explanation of terms given in IS : 9000 (Part 1)-1977† shall apply.

3. TEST MACHINE AND MEASURING SYSTEM

3.1 Drop, Topple and Free Fall Platform

3.1.1 The machine shall consist of a test platform consisting of a steel plate not less than 6.5 mm thick wet floated on and bolted down to a fully set concrete block at least 500 mm thick (see Fig. 1).

NOTE — It is found from experience that plates of thickness more than 12 mm are better suited.

3.1.2 The size of the test platform shall be larger than the largest surface of the item that will be tested.

3.2 Dropping Device

3.2.1 The dropping device shall consist of a suspended chain pulley block. The capacity of chain shall be such as to take the complete load of heavy item.

3.2.2 Nylon/cotton ropes shall be employed for looping the test item.

3.2.3 A quick release hook shall be attached to the chain pulley block for quick release of items to simulate free fall.

3.3 Measuring System

3.3.1 A suitable (pedestal type) adjustable scale with a pointer shall be provided for measurement of drop heights.

*Basic environmental testing procedures for electronic and electrical items: Part 7 Impact test.

†Basic environmental testing procedures for electronic and electrical items: Part 1 General.

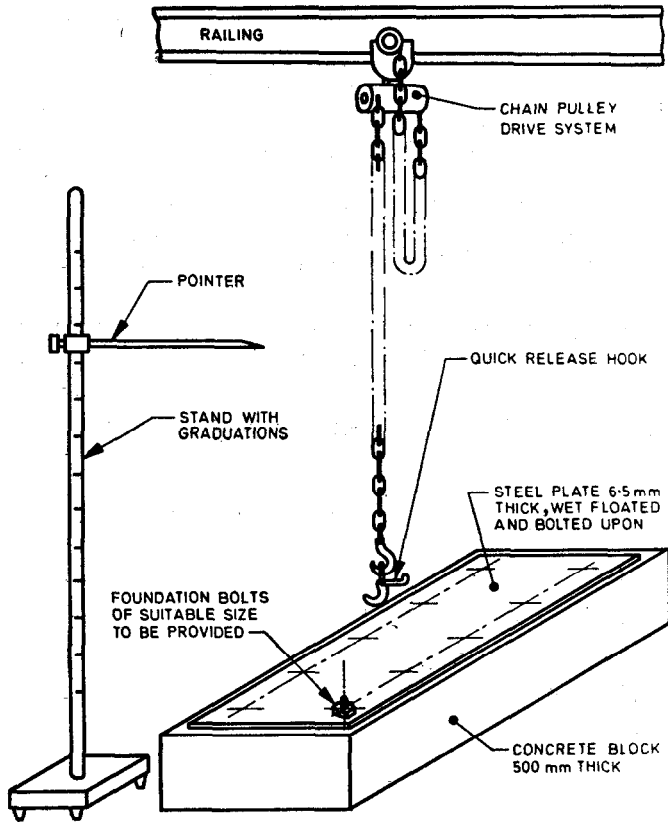


FIG. 1 TEST PLATFORM FOR DROP, TOPPLE AND
FREE FALL TEST

3.3.2 The drop height/height of fall shall be measured between the bottom most projection of test item and top of steel platform.

3.3.3 An instrument for measuring the angle shall be provided for carrying out drop and topple tests.

4. CONSTRUCTION, WORKMANSHIP AND FINISH

4.1 The concrete block shall be fully set/cured.

4.2 The steel plate shall be of uniform thickness with a true surface.

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4.3 For carrying out wet-floating, the steel plate shall be placed on wet cement spread on concrete block and bolted down carefully such that no air is trapped between the concrete block and the steel plate.

NOTE — The test platform should be cast with a rich concrete mix either 1 : 1.5 : 3 or 1 : 1 : 2. This should be well vibrated to see that enough slurry comes on the top surface and air bubbles are expunged out completely; this will automatically enable the top surface to become flat. The cast platform should be left for half an hour to one hour.

The steel plate should then be placed, first on a longer edge and then gently turned flat. Light tappings with small hammer on steel plate will ensure that it makes a perfect contact with the top surface of the concrete.

4.4 The bolts used for fixing the steel plate into the block shall be fixed while concrete block is being made; the bolts shall not project above the nuts.

4.5 The concrete block shall be plastered on sides and finished.

5. SAFETY

5.1 Suitable protective fencing shall be provided for personal safety.

6. INFORMATION TO BE FURNISHED BY THE INDENTOR

6.1 The following information shall be furnished by the indentor:

- a) Dimensions of steel plate and concrete block, and
- b) Load capacity of the chain pulley block.